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Normalizing RPA Operations: The Time Is Now

by

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Abstract

The United States Air Force Remotely Piloted Aircraft (RPA) community developed under a state of constant combat-surge operations and is rapidly approaching 65 sustained RPA combat air patrols (CAPs). As a result of this combat focus, the community has not experienced normalized garrison operations. As the requirements in United States Central Command's (USCENTCOM) area of responsibility (AOR) begin to lessen, other Geographic Combatant Commanders (GCCs) are requesting additional RPAs. This transitional phase provides an opportunity to normalize RPA operations. The Air Force should take advantage of this shift in global operations to establish a normalized steady state operational framework for the RPA community. To accomplish this, the USAF must ensure consistent strategic emphasis on RPA steady state sustainability and readiness, counter poor international and domestic public perceptions of RPAs, provide operational priority to dedicated training, and establish a method for centralized global management that maximizes RPAs' inherent economies of scale. These steps are necessary to facilitate full spectrum readiness for all geographic combatant commands.

INTRODUCTION

On May 29, 2010, *The Los Angeles Times* reported, "A U.S. military investigation has harshly criticized a Nevada-based Air Force drone crew and American ground commanders in Afghanistan for misidentifying civilians as insurgents during an U.S. Army Special Forces operation in Oruzgan province in February, resulting in the deaths of as many as 23 civilians." As a result, the commander of NATO forces in Afghanistan at the time, General Stanley A. McChrystal, requested the Air Force focus attention on "drone training and operations."[1] Even though the media and the general public often refer to the MQ-1 Predator and the MQ-9 Reaper as drones or unmanned, humans are integral to the kill chain. The United States Air Force (USAF) now refers to these aircraft as Remotely Piloted Aircraft (RPAs) in an effort to remove the false notion of drone autonomy. To reduce the probability of such devastating mistakes as described above, humans require consistent, dedicated, and realistic training. RPA aircrews are no different. The Air Force should act now, during this period of transition, to implement an effective, normalized steady state RPA model.

The USAF RPA community developed under a state of constant combat-surge operations and is rapidly approaching 65 sustained RPA combat air patrols (CAPs). As a result of this combat focus, the community has not experienced any period of normalized garrison operations. The Secretary of Defense's (SECDEF) January 2012 guidance calls upon the USAF for the additional capability to surge to 85 CAPs. This build-up and surge responded to requirements for increased Intelligence, Surveillance, and Reconnaissance (ISR) support for Operations IRAQI FREEDOM and ENDURING FREEDOM. As the requirements in United States Central Command's (USCENTCOM) area of responsibility (AOR) begin to lessen, other Geographic

Combatant Commanders (GCCs) are requesting additional RPAs. This transitional phase provides an opportunity to normalize RPA operations.

Historically, USAF weapon systems rotated to the CENTCOM AOR on an established Air Expeditionary Force (AEF) cycle, lasting roughly 18 months. This cycle allowed aircrew and equipment a period of reconstitution and subsequent buildup for combat operations in a planned and controlled training environment. During reconstitution, aircrews regained proficiency across expected core capabilities traditionally governed by a Ready Aircrew Program (RAP) cycle developed by the Numbered AFs and Major Commands. The RPA community has never experienced an equivalent reconstitution period. There have been momentary pauses in combat operations when RPA aircrews were able to refresh waning skillsets, yet in most cases such pauses were insufficient for complete squadron reconstitution. Instead, aircrews conduct RPA Continuation Training (CT) during combat operations in the AOR either as a rare dedicated training sortie or during transit to and from the target area. Training in simulators capable of performing the majority of functions under semi-realistic environments supplements real-time RPA CT.

Flying daily combat missions with a few training sorties interspersed provides a relatively proficient aircrew for the specific AOR. Unfortunately, this means the additional capabilities expected of RPA aircrew can suffer from lack of training. It is expected that most RPA aircrews are proficient performing ISR and close air support (CAS) in the CENTCOM AOR. Very likely, though, many are not as proficient as they should be in tasks such as strike coordination and reconnaissance (SCAR) or over-water operations. RPA training in the United States occurs primarily in the deserts of Nevada, California, and New Mexico. These environments are similar to the desert environments of the Middle East and reinforce the skills needed in current conflicts.

Neglecting variety in training environment only compounds the concerns associated with the lack of RPA reconstitution time.

To increase proficiency in all required skillsets and in multiple environments, the RPA enterprise must take advantage of the unique ability for aircrew to be geographically separated from the aircraft. Remote Split Operations (RSO) allows aircrews in the US to fly combat missions in Afghanistan, for example. This core concept is one of the RPA community's greatest strengths. With a limited operations and maintenance footprint collocated with the aircraft, aircrews launch and recover at local airfields via line-of-sight (LOS) operations. Then an aircrew from anywhere in the world takes control via satellite relay and flies the mission, combat or training. Ultimately, a tremendous RPA combat strength is also a tremendous training strength.

This paper stresses the necessity for the Air Force to take advantage of the shift in global operations to establish a normalized steady state operational framework for the RPA community. The strategic guidance is clear that RPAs will continue to play a significant role in the future. To accomplish this, the USAF must ensure consistent strategic emphasis on RPA steady state sustainability and readiness, counter poor international and domestic public perceptions of RPAs, provide operational priority to dedicated training, and establish a method for centralized global management that maximizes RPAs' inherent economies of scale. These steps are necessary to facilitate full spectrum readiness for all geographic combatant commands.

HISTORY

Mans' use of unmanned aircraft is not new. In fact, it dates back as far 200 B.C. with the use of kites to triangulate the enemy's defensive fortresses. Lighter-than-air craft were used for reconnaissance and even lethal force periodically throughout the 19th and early 20th centuries. By World War II, western militaries were experimenting with unmanned heavier-than-air craft that produced mixed results. Dr. David Mets, of the Air Force Research Institute, points out that the first consistently used remotely piloted aircraft came of age during the 1970s with the Americans using the Ryan BQ-34 Firebee for leaflet drops and chaff corridors during the Vietnam conflict. The Israelis successfully used RPAs in 1982 as decoys and surveillance platforms, from which the Americans spawned the Pioneer. "Only 11 Pioneer systems were deployed, but they flew 300 sorties and had more than 1,000 combat hours" spotting for battleship guns during Operation DESERT STORM.[2]

As a result, the Department of Defense (DoD) developed the RQ-1 Predator, which was first used in the Balkans in the mid-1990s. The RQ-1 became the foundation for the current RPA fleet as DoD soon armed it with a laser designator and laser guided weapons. The newly designated MQ-1 achieved its first Hellfire missile kill in 2002, proving a lethal capability beyond its core ISR function. The DoD then developed the larger and more capable MQ-9 Reaper focused more on a strike capability than ISR.[3] Dr. Mets contends that the recognized "constant [with RPA development] is to get our precision, lethality, and standoff at a minimum price in lives and treasure."[4]

Secretary of the Air Force guidance in early 2012 is for the MQ-1/9 community to grow to 65 CAPs with the additional ability to surge to 85 CAPs.[5] This "new target of 65 RPA orbits by 2013 [demonstrates] a 1200% growth in operations since the war in Afghanistan began [in

2001].”[6] There is no guarantee, however, that 85 CAPs is the true end-state for the RPA community. Regardless, this rapid growth highlights the requirement for aircrews to remain proficient across the spectrum of capabilities and global geographies. This will only be achieved through a normalized operational pace that includes dedicated training as a core element.

ASSUMPTIONS & TECHNICAL EXPLANATION

There are thousands of unmanned military vehicles operating today and many more on the way according to the *Unmanned Systems Integrated Roadmap, FY2011-2036*. Operation and development of unmanned vehicles are not limited to airborne assets. Each domain boasts unique capabilities, limitations, and control mechanisms. Still, considering Congressional staffer Jeremiah Guertler's assertion that "DoD's unmanned aircraft inventory increased more than forty-fold from 2002 to 2010,"[7] it is difficult to lump all unmanned vehicles together into one concept. Given this challenge, this paper will focus on unmanned aerial vehicles (UAVs), and more specifically, the MQ-1 Predator and the MQ-9 Reaper.

For the purposes of this paper, all references to unmanned aerial vehicles (UAV), unmanned aircraft systems (UAS), or drones is synonymous with the Air Force's current chosen designation, remotely piloted aircraft (RPA). Likewise, RPA may be used interchangeably with MQ-1/9. Although the MQ-1 and MQ-9 are unique aircraft, they share enough core similarities to consider them one community in this paper. Additionally, this paper focuses on the aircrews' requirements and does not address the greater enterprise required for support and exploitation.

There are currently three methods of employing the MQ-1/9: line of sight (LOS); beyond line of sight (BLOS); and remote split operations (RSO). The strengths of each are not only leveraged in combat but also offer significant training options as well. In LOS operations, all associated personnel and equipment are collocated at or near the airfield. The unit that launches and recovers the aircraft also flies the operational mission. The mission crew can fly all RPA mission sets via LOS operations. The ground station and aircraft must remain within line of sight, however, limiting the geographic range of operations.

BLOS operations use a satellite relay and are not limited in geographic range. As with all three methods, during BLOS operations the aircraft is launched via LOS links. Prior to the aircraft exceeding the range limitation of LOS operations, the aircrew establishes a satellite communications link between their ground station and the aircraft. This allows one unit to launch and recover the aircraft and fly the operational mission well beyond the limitations of the LOS equipment.

The third method of employment, RSO, offers the greatest leverage to USAF forces. Again, the aircraft is launched via LOS. However, during RSO, the mission aircrew establishes satellite communications between their ground station and the aircraft via a geographically separated ground relay antenna. The great advantage of RSO is the ability for a mission crew at a single location to fly an aircraft literally anywhere in the world. In a matter of hours, the mission aircrew can terminate operations in one AOR and reconfigure their ground station to fly a mission in a different part of the world.[8]

The Appendix offers a detailed explanation of each employment method.

CHALLENGES & RECOMMENDATIONS

Strategic Guidance

Chief of Staff of the Air Force, General Norton Schwartz, provided strategic guidance to the force that "a heavy operations tempo since 9/11 [September 11, 2001] has resulted in detrimental effects on our overall readiness, particularly in the context of…lost opportunities for full-spectrum training, and stress on our personnel."[9] There are few areas where this is truer than the RPA community. General Schwartz's solution is to focus on readiness as the Air Force faces budgetary constraints and a reduction in force structure.[10] However, as much of the Air Force shrinks, the MQ-1/9 community has continued to grow. This continued growth requires new emphasis on dedicated core-capability training, alongside continued contingency operations.

With the withdrawal of military forces from Iraq and the anticipated 2014 withdrawal from Afghanistan, the time is ripe to establish a steady state for future RPA operations. The *Unmanned Systems Integrated Roadmap, FY2011-2036* states: "As forces drawdown in theater and redeploy, the Services will require comprehensive continuation and Joint-forces training in the peacetime environment at bed-down and selected Joint-training locations. Failure to prepare for this eventuality will result in a loss of combat gained experience."[11] The future presence of USAF RPAs is clear as Congress set the goal in 2000 of "making 'one-third of the aircraft in the operational deep strike force aircraft fleet' unmanned."[12] In order to achieve this paradigm shift the USAF must provide consistent strategic emphasis and operational support to ensure RPA steady state sustainability and readiness.

Public Perception

World opinion of RPAs was formed watching US employment in the Iraq and Afghanistan war zones over the last decade. More importantly, that opinion was altered

watching US RPAs strike in Yemen and Pakistan. Just as important, the US public is forming opinions, expectations, and concerns about current employment of RPAs over their homeland. World and US opinion greatly affects operational employment and training opportunities for RPAs. Domestically, if the American public sees RPAs as the government's spy force infringing on basic civil liberties, they will resist necessary local training support for airspace coordination, range access, and basing. Internationally, similar concerns, compounded by the fear of weaponized RPAs, require diplomatic involvement to maximize operational and training opportunities in all geographic combat commands.

Recently compounded by a private sector explosion of RPAs, American media and campaign groups are very interested in the consequences of increased aerial surveillance. Mac Thrower of *The Daytona Beach News-Journal* raises concerns of both safety and privacy despite the many positive contributions of domestic RPA use.[13] A report from *The Economist* is not quite as optimistic, noting that "the American Civil Liberties Union…says drones raise 'very serious privacy issues' and are pushing America 'willy-nilly toward an era of aerial surveillance without any steps to protect the traditional privacy that Americans have always enjoyed and expected.'"[14] Bill Van Auken, writing for geopoliticalmonitor.com, takes the argument significantly further opining pro-RPA legislation is "the link between the explosive growth of US militarism abroad and the steady advance of police state repression at home."[15]

Concerns over RPAs are not limited to the US borders. Akbar Ahmed, a former Pakistani high commissioner to the United Kingdom and current Ibn Khaldun Chair of Islamic Studies at American University in Washington, is concerned the US might be causing more problems than solutions with RPAs, pushing existing conflicts in "dangerous directions." He refers to "the dreaded drone, which arrives from distant and unknown destinations to cause death

and destruction."[16] RPAs are highly effective ISR and strike aircraft heavily employed under the Obama administration with engagements in six countries in 2011.[17] Prolific and controversial use of any weapon system requires an aggressive public campaign to counter disinformation and public distrust. The USAF must take the lead to educate the public about RPA training requirements and emphasize transparency in domestic events in order to achieve the public support needed to fully exploit normalized operations.

Operational Priority

In order to achieve normalized RPA operations that support Combatant Commanders (CCDR), dedicated training must be given certain operational priority. Lieutenant General David Deptula, former Deputy Chief of Staff for Intelligence, Surveillance, and Reconnaissance, Headquarters USAF, identified the need in 2008 for "clearly assigning roles and responsibilities for optimizing employment of theater-capable UAS to the component commander tasked by the Joint Forces Commander (JFC) responsible for theater air operations."[18] He considered the MQ-1/9 best utilized as a theater asset to support the JFC. As a theater asset which does not regularly rotate out of the AOR, however, CCDRs have a responsibility to facilitate RPA training opportunities in their AOR.

CCDRs should therefore apportion RPA training sorties as part of their air plan. This is consistent with strategic guidance and allows more complete exploitation of the RPA enterprise. Understandably, operational requirements could, at times, demand commitment of 100% of a CCDR's resources. Nonetheless, once apportioned RPA training sorties become part of normal operations the improved readiness and capability will become apparent. Apportioned training opportunities are only half of the equation. Once training assets are made available by the CCDR, there must be a system in place to match assets with training requirements to balance

RPA global operations and training. For the USAF to "ensure that their force presentation of theater-capable UAS allows flexible allocation to combatant commands commensurate with their needs," a global operations coordination center is needed.[19]

Coordination Center & Basing

Efficient combinations of a central coordination center and basing provide training options unique to RPAs. A global operations coordination center offers flexible centralized control and "will dynamically realign the MQ-1/9 enterprise to address critical nodes in the manner by which the force is organized, trained, and equipped to achieve global agility in a matter of minutes."[20] And, since RPAs can train via any of the three employment methods described earlier, purposefully located bases enables a variation in operating environments. Of course, basing is often influenced more by politics than operational requirements. Nonetheless, current basing plans can achieve the desired effect of training-environment diversity provided there is a proper global coordination capability.

Ultimately, the launch location dictates the training environment. A launch and recovery element (LRE) capability must coexist with the aircraft and the associated maintenance footprint. Post launch, the LRE can either maintain control of the aircraft for local training or hand the aircraft off to a mission control element (MCE) for training via beyond line of sight (BLOS) or remote split operations (RSO). The great advantage in RSO is that an MCE crew nearly anywhere in the world can now train in the environment near the launch location. To take full advantage of this concept, the RPA community must leverage "additional efficiencies using Total Force enterprise associations."[21]

For example, an MCE crew stationed in Nevada requires training over forest and heavy vegetation. Local operations will not suffice. However, if an MQ-1 is launched from Ft Smith,

Arkansas and then handed over to the Nevada MCE crew, the training is now possible. The same example works in reverse where the Ft Smith MCE crews needing over-desert training can take control of aircraft launched in Nevada. However, this level of leverage is difficult to achieve without a centralized coordination center.

Additionally, it is important to consider both global and domestic training opportunities. The same concepts from the above example apply to anywhere in the world. If MQ-1/9 assets allocated to a particular geographic command are available for training sorties, any MCE crew, regardless of location, could take advantage of the enterprise. The global operations coordination center could capture all global training opportunities and coordinate potential users, within the Secretary of Defense's prioritized guidelines, to focus "on maximizing effectiveness of available RSO cockpits."[22]

Maximizing Economies of Scale

Globally coordinated RSO maximizes the RPA's economies of scale. "For example, the MQ-1B requires four aircraft for a single CAP. For five CAPs from a single location, however, only 12 aircraft are required, not 20."[23] Similarly, a single dedicated unit can fly operational and training missions from that location. Or even better, multiple units around the world can fly operational and training missions from that location via coordinated RSO. This concept is not limited to continental US (CONUS) training opportunities but extends to global training and operational events. By establishing at least one semi-permanent launch and recovery location in each geographic command and linking that operation to a central coordination center, the RPA enterprise increases training effectiveness substantially. Likewise, the USAF must move beyond the traditional sense of asset ownership and responsibility in order to fully exploit RPA economies of scale. Relationships must operate on a basis of user responsibility. RPAs are not

traditional weapons systems in this way. Sharing assets to accomplish global training must become normal.

Recently in CONUS, Federal Aviation Administration flight restrictions forced the Texas Air National Guard's 147th Reconnaissance Wing (RW) to establish MQ-1 LR operations at Fort Polk Army Airfield, Louisiana. Unable to fly from their home airfield near Houston, Texas, the 147th must conduct LOS and BLOS training missions from an area geographically separated from their home station. This seems less than ideal. However, it highlights the unique ability to improve RPA training opportunities through geographically separated operations. Consequently, 147th RW officials reported, "Flying from [Fort Polk, Louisiana] will allow Air Guard to train directly with Army units rotating through pre-deployment training."[24]

Enhancing RPA economies of scale should not be restricted to USAF assets or locations. For years, the USAF, British Royal Air Force (RAF) and Italian Air Force (IAF) have collaborated on MQ-1/9 operations. The RAF recently logged its 30,000 combat flight hour over Afghanistan. "While launched and recovered by RAF personnel attached to USAF's 62nd Expeditionary Reconnaissance Squadron at Kandahar Air Base, RAF 39 Squadron [aircrews] operating from Creech AFB, Nevada, fly the armed MQ-9s during the main portion of each sortie."[25] Similarly, IAF aircrews train along-side USAF aircrews at Holloman AFB, New Mexico. These preexisting relationships should enable further international coordination within the greater RPA enterprise. Collocating USAF personnel and equipment at RAF and IAF bases for launch and recovery operations extends training opportunities and maximizes efficiency. Furthermore, coordinated international agreements allowing RAF aircrews to launch and recover USAF assets for USAF aircrew RSO training missions bolsters the enterprise's economies of scale.

CONCLUSION

Balancing Operations & Training in a Global Environment

Providing well-trained aircrews to CCDRs and JFCs across the world is the ultimate goal of globally coordinated RPA operations. There is no argument for giving training sorties higher priority than operational ones. However, as senior leaders have become accustomed to RPA's constant combat surge, the USAF must reemphasize the need for dedicated quality training. The opportunity exists now to strike a balance that provides apportioned sorties for RPA training throughout all geographic commands. The RPA community must be able to provide quality full spectrum ISR, armed reconnaissance, and armed over watch in any environment. In order to do so over the Strait of Hormuz, aircrews must train over water. In order to do so over the jungles of Central America, aircrews must train over jungles. In order to continue to do so over the deserts of the Middle East, aircrews must continue to train over deserts. This capability exists through globally coordinated RPA remote split operations.

Ultimately, the USAF must provide consistent strategic guidance and operational support for efficient global steady state RPA operations. To be effective, the USAF must also combat adverse public perceptions through education, transparency, and fostered domestic and international relationships. Additionally, CCDRs should emphasize dedicated training through apportioned training opportunities for RPAs within their geographic AORs while an RPA global coordination center manages the training opportunities to maximize the enterprise's economies of scale. The capability exists and the time is right to normalize RPA operations now.

Notes

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[21] Ibid.

[22] Ibid.

[23] Ibid.

[24] "Home Deployment," *Air Force Magazine Daily Report eNewsletter* (March 15, 2012).

[25] "Sun Never Sets on Reaper Ops," *Air Force Magazine Daily Report eNewsletter* (March 22, 2012).

Glossary

AEF	Air Expeditionary Force
AOR	Area of Responsibility
BLOS	Beyond Line of Sight
CAP	Combat Air Patrol
CAS	Close Air Support
CCDR	Combatant Commander
CENTCOM	Central Command
CONUS	Continental United States
CSAF	Chief of Staff of the Air Force
CT	Continuation Training
DoD	Department of Defense
FOL	Forward Operating Location
GCC	Geographic Combatant Commander
GCS	Ground Control Station
GDT	Ground Data Terminal
IAF	Italian Air Force
ISR	Intelligence, Surveillance, and Reconnaissance
JFC	Joint Forces Commander
LOS	Line of Sight
LR	Launch and Recovery
LRE	Launch and Recovery Element
MCE	Mission Control Element
OCONUS	Outside Continental United States
RAF	Royal Air Force
RAP	Ready Aircrew Program
RPA	Remotely Piloted Aircraft
RSO	Remote Split Operations
RW	Reconnaissance Wing
SATCOM	Satellite Communications
SCAR	Strike Coordination and Reconnaissance
SECDEF	Secretary of Defense
SETSS	Satellite Communication Earth Terminal Sub-system
SOC	Squadron Operations Center
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle
US	United States
USAF	United States Air Force

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